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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,342	12/15/2003	Deepak Shukla	84415AEK	4634

7590

07/18/2005

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EXAMINER

HON, SOW FUN

ART UNIT

PAPER NUMBER

1772

DATE MAILED: 07/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/736,342

Applicant(s)

SHUKLA ET AL.

Examiner

Sow-Fun Hon

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1772

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-20 is/are pending in the application.
- 4a) Of the above claim(s) 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/25/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. This application contains claim 20 drawn to an invention nonelected with traverse in the response dated 03/31/05. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Response to Amendment

Withdrawn Rejections

2. The 35 U.S.C. 102(b) and 103(a) rejections have been withdrawn due to the amendment dated 03/31/05.

New Rejections

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-7, 9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiota et al. (US 5,773,178) in view of Glover et al. (US 6,028,124), as evidenced by Swanson Technologies.

Regarding claims 1, 4-5, 7, 9-10, Shiota teaches a multilayer film comprising a substrate (polyimide alignment layer) bearing an aligned fixed (cured) (column 7, lines 55-68 and column 8, line 1) liquid crystal layer wherein the fixed liquid crystal layer

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contains as a photocationic initiator, an onium salt which can be diphenyliodonium arsenate (column 7, lines 45-55), wherein the two R groups are phenyl groups (claim 7) or triarylsulfonium hexafluorophosphate (column 3, lines 60-68). The structure of the onium salt is the same as formula (I) of Applicant, as evidenced by Glover.

Glover teaches onium salt photoinitiators, specifically sulfonium and iodonium salts (column 3, lines 30-35), and provides examples in the form of a triarylsulfonium salt (b of Applicant = 3) and a diaryliodonium salt (b of Applicant = 2) (column 3, lines 60-65). A triarylsulfonium salt is in the form of $R^3S^+MX_n^-$ wherein R^3 is an aromatic carbocyclic radical having from 6 to 20 carbon atoms (column 3, lines 35-40), which is equivalent to R of Applicant (b of Applicant = 3) (claims 4-5, 7). The structure of the onium salt in terms of Applicant's nomenclature is thus: aryl = R of Applicant; S⁺, I⁺ = M⁺ of Applicant.

Shiota teaches the sulfonium cation which is from group VIa of the Periodic Table; and iodonium cation (column 39, lines 60-68) which is from group VIIa of the Periodic Table (claims 9-10), as evidenced by Swanson Technologies.

Swanson Technologies shows that sulphur (S), is an element in group VIa of the Periodic Table, and that iodine (I) is in group VIIa of the Periodic Table.

Regarding claims 2-3, 6, 14, although Shiota fails to teach that at least one R group is an alkyl group of 1-25 carbon atoms or 1-6 carbon atoms, or a heteroaryl group, or that M is a member of a 5- or 6-membered ring fused to one or more of the R groups, the substitution is well known in the onium salt photoinitiators, as evidenced by Glover.

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Glover teaches the sulfonium and iodonium salt photoinitiators (column 3, lines 30-35), wherein the sulfonium salt has a general formula of $R^3_3S+MX_n^-$, and R^3 is an aromatic carbocyclic radical having from 6 to 20 carbon atoms (column 3, lines 35-40), that can be substituted with monovalent alkyl groups (radicals) of 1 to 8 carbon atoms, which overlaps the claimed range of 1-25 carbon atoms (claim 2) and of 1-6 carbon atoms (claim 3); and also substituted with a heteroaryl group (aromatic heterocyclic radicals) (claim 6) (column 3, lines 36-46), which means that M (S and I) can be a member of a 5- or 6-membered ring fused to one or more of the R groups (claim 14).

Therefore it is well known to one of ordinary skill in the art at the time the invention was made, to have substituted at least one R group of the onium salt of Shiota with an alkyl group of 1-25 carbon atoms or 1-6 carbon atoms, or a heteroaryl group wherein M (S and I) can be a member of a 5- or 6-membered ring fused to one or more of the R groups, in order to obtain an onium salt photoinitiator with the desired functionality, as evidenced by Glover.

Regarding claims 11-13, Shiota teaches PF_6^- (hexafluorophosphate) and BF_4^- (tetrafluoroborate) as counterion X (column 3, lines 60-65), which, being the same as Applicant's counterion, is a counterion whose conjugate acid has a pKa of less than 5 (claim 12) which is less than 10 (claim 11).

Regarding claims 15-18, Shiota teaches that the film contains 0.1 – 10 wt% onium salt in the layer (column 3, lines 55-67), which encompasses the claimed range of up to 10 wt % (claim 17) and of less than 2 wt % (claim 18). The amount of 0.1 – 10 wt% onium salt in the layer (column 3, lines 55-67) is expected to increase the tilt of the

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liquid crystal by at least 10 % compared to a layer with no onium salt, and to contain the amount which is sufficient to improve the tilt without changing the refractive index of the layer by more than 10 percent.

Regarding claim 19, Shiota teaches a liquid crystal display comprising the film (column 2, lines 13-17).

Response to Arguments

5. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon
Sow-Fun Hon
06/29/05

[Signature]
HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772 *6/30/05*